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ABSTRACT

This paper examines the impending crisis of depletion of natural resources and explores the development of alternative resources for use. The topic of energy education needs to be included in the social studies curriculum. The program must focus around the following three principles: (1) the coming transition from fossil fuels to some other energy source is not the first we have faced, and it will not be the last; (2) shifting to new energy sources will take time, involve key policy decisions, and will require massive capital reallocations; and (3) beware of the one, simple solution. By building on these three guiding principles, energy education will increase the awareness of students on this vital topic. (Contains 23 references.) (EH)

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SUSTAINABLE ENERGY: AN ENERGY EDUCATION TOPIC THAT BELONGS IN THE SOCIAL STUDIES CURRICULUM

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SUSTAINABLE ENERGY: AN ENERGY EDUCATION TOPIC THAT BELONGS IN THE SOCIAL STUDIES CURRICULUM

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It is dangerous to predict when various natural resources will be depleted; it is an enterprise that has embarrassed some real experts. (Tierney, 1990) Even so it seems to be a low risk venture to predict that sometime during the lives of today's first graders that the fossil fuels (coal,oil and natural gas) will become in such short supply that they will no longer be used for heating and as fuel for transportation. For while the experts disagree on when this is likely to happen no one maintains that our supply of these three resources is inexhaustible. Sooner or later our supply of them will be gone and the faster we consume them the sooner that time will come.

What will be the energy source of choice once supplies of these fossil fuels are depleted? Again, the experts disagree. For example, Christopher Flavin argues that hydrogen gas will eventually become the main energy carrier. (Flavin, 1992) In France and Japan nuclear energy may carry the burden while in other countries solar or hydro power may supply much of the energy that is needed. About all we know at this point is that it will not be oil and natural gas, and probably not coal,

that heat our homes and fuel our transportation seven or eight decades from now.

So where does social studies fit into this picture? When the United States faced an energy crisis in the 1970's and 1980's those of us in social studies did our part with energy education. The National Council for the Social Studies developed and published energy guidelines, journals carried special sections on the energy situation (Eckenrod, 1983; National Council for the Social Studies, 1980; Perry, 1983), workshops were offered and special publications were developed to bring teachers up-to-date on the topic (Allen, 1980), and special energy education instructional materials were developed (Foreign Policy Association, 1980; League of Women Voters, 1977). In short, we responded to the crisis as did most everyone else.

In some respects the situation in 1993 is quite different from the days of lines at the gas pumps, brownouts, and skyrocketing energy prices. Gasoline is plentiful and still inexpensive despite the new federal tax (Murphey, 1993), the Gulf War, the "Mother of all wars", is now history. From the vantage point of the average consumer things are back to normal. But beneath the surface lurks the potential for another crisis. In fact, we are more dependent today on imported oil than we were twenty years ago when we experienced the fist oil crisis (Roeder, 1993). But perceptions are powerful forces in shaping our national priorities and as a result we once again have lost our sense of urgency about energy and energy education (Marker, 1991). With the exception of the January 1992 issue of *Social Education* there have been virtually no articles recently on teaching about

energy in the social studies. And while I have only fragmentary evidence [1] it appears that very few preservice elementary teachers consider energy to be an important topic.

That is not to say that progress, much of it begun during the 1970's and '80's, is not being made. Appliances, homes, automobiles, and factories are all more efficient than they were when the first energy crisis hit us (Editors, 1990), but that is precisely the point of this paper! Our current level of use of fossil fuels is not sustainable and basic changes in how we use energy take time and are terribly complex; everything seems connected to everything else. The transition to whatever will replace the fossil fuels has already begun and will take decades and that is what we should be discussing with our students in social studies classes.

The temptation to ignore teaching about energy until the next oil shock or greenhouse alert is strong indeed. Why not simply wait until energy once again becomes a "hot topic"? But if we wait until concern over our dependence upon fossil fuels becomes so problematic that the average citizen is alarmed and demanding action we will have waited too long! So what, short of another crisis, is there to teach about energy?

I want to propose three principles, "big ideas" if you will, that I believe will be as relevant five or ten years from now as they are today. My proposal is that we focus our current energy education around these three relatively timeless generalizations:

Generalization # 1: The coming transition from fossil fuels to some other energy source is not the first we have faced, and it will not be the last.

Generalization # 2: Shifting to new energy sources will take time, involve key policy decisions, and will require massive capital reallocations.

Generalization # 3: Beware of the one, simple solution.

History teachers who are reluctant to add one more topic to their already overflowing courses, might want to reconsider when it comes to dealing with the transition to a sustainable energy. History advocates have long maintained that history can inform our current decisions as citizens (Crabtree, Nash, Gagnon, and Waugh, 1992) and this is one case where that argument certainly holds. History does indeed have something to teach us about the transition that lies ahead. (Perry, 1983)

At one time wood and then coal were the fuels of choice in the United States. The shift from an energy system based on wood to one based on coal began about 1850, a decade before the Civil War. Robert LaRue (LaRue, 1988) has developed a set of lessons to illustrate just how dependent the nation was on wood as it's main energy source. By 1885 coal had become the dominant energy source, a position it was to hold until 1950 when it was surpassed by oil as our major fuel. (p. 154)

How long will our current "Oil Age" last? As I have already indicated, estimates vary. Some, like Lovins (1977) and Stobaugh and Yergin (1979) are not very optimistic. North Sea oil production has already plateaued and U.S. and

Russian production continues to decline. Thus far the large oil producers in the Middle East have picked up the slack and current projections show thêir share of the market accelerating from 27 percent in 1990 to nearly 40 percent by the year 2000 (Flavin, 1992). Our increasing dependence on a very troubled part of the world is not without it's worries, or as Flavin and Lenssen (1991) put it, "...not only is the world addicted to cheap oil, but the largest liquor store is in a very dangerous neighborhood" (p. 23).

Ironically it may not be the diminishing supply of fossil fuels that forces the move to a sustainable energy supply as much as it is what fossil fuels are doing to the earth's atmosphere. As the Chinese economy, where coal is now the major fuel, continues to grow and with the former Soviet Republics turning back to coal as they struggle to survive, concern over the global atmosphere can only persist. In 1991 I expressed the belief that "...the atmosphere may reach 'full' before our oil reserves reach 'empty'." (Marker, 1991, p.184) The rapid increase in the world's use of coal makes me believe that this is even more true today than it was two years ago.

But all is not lost and we should draw some comfort from the fact that twice during the last two centuries we have made the transition from one fuel to another and it is the job of history and the historians to help us anticipate what lies ahead as we move to a new, more sustainable energy supply.

The second generalization, i.e., *shifting to new energy sources will take time, involve key policy decisions, and will require massive capital reallocations,*

presents us with an instructional challenge. We must find a way to motivate students to think seriously about a problem that may be decades into the future, where most of the options for solving the problem are complex, and where the current generation is going to have to make some sacrifices for the good of future generations. The National Issues Forum (Kinghorn, 1991) proposes the following four options for discussion.

> Choice 1: Give priority to achieving energy independence by taking advantage of domestic reserves of coal, oil, and natural gas.
>
> Choice 2: Focus on developing renewable energy resources, such as solar energy, that are plentiful and environmentally benign.
>
> Choice 3: Use a new generation of safer nuclear reactors to meet the growing needs for energy.
>
> Choice 4: Focus on conservation as a way of reducing our need for ever increasing amounts of energy.

Each of these four options has is proponents and opponents (Allen, 1980; Flavin, 1992; Flavin and Lenssen, 1990; Editors, 1990; Foreign Policy Association, 1980; Hayes, 1977; League of Women Voters, 1977; Stobaugh and Yergin, 1979).[2] Each would require major capital expenditures and decades to phase in. Each would require a major set of supporting policies at the state and federal level. But the most difficult condition associated with this set of choices is that we do not have the luxury of pursuing all four options simultaneously. Some have described the choice as that between

"soft" and "hard" energy paths (Lovins, 1977) but how ever they are characterized some of the paths are mutually exclusive. Thus far we seem, as a nation, to be victims of indecision, though admittedly it is too early to tell exactly what the Clinton Administration's long-range plans are. Our indecision is a fitting illustration of what Rodney Allen (1982) was referring to when he wrote:

> America's energy challenge is one of vision and determination, not resources. The debates over energy policy are colored by self-interest and diverse ideologies more than by energy realities or scientific concepts. (p. 17)

As I indicated earlier, getting students to take the discussion of such choices seriously, especially since most adults presently do not, is not going to be easy but that makes it no less important. Our students are, after all, the ones most likely to have to live with the results of the whatever path is finally chosen.

Generalization three, i.e., *Beware of the one, simple solution*, does not apply uniquely to the discussion of sustainable energy. In this age of the thirty-second sound bite we have grown accustomed to seeing complex issues reduced to simplistic either/or choices. What we need is a new version of the old joke that says, "If you remain calm while those about you seem to be loosing their heads, then maybe you don't fully understand the situation!" Perhaps we need to help students understand that if it looks simple then they probably do not fully comprehend the complexity or seriousness of the situation. Robert Hanvey (1975) argues that there are "side-effects" and "surprise-effects" and that we need to

help students learn to be on the look out for both as they examine complex issues.

The media's search for headlines that will attract readers, even if those headlines are misleading, also contributes to the artificial nature of proposed solutions, but in a different way. For example, many of today's global issues include a concern for the gap between rich and poor, whether it is nations or individuals. This certainly applies to the energy situation where a few wealthy nations consume a majority of the planet's energy resources. Stonebarger (1993) maintains that we are preoccupied with the gap rather than with the progress being made by those at the lower end so we tend to ignore the "good news" often associated with news reports. This could especially be a problem in our own field where social studies educators tend to see the world from a quite different political perspective than that of the teachers with whom they work (Leming, 1992).

When even the experts disagree, and those of us in social studies are hardly experts when it comes to energy, it is doubly important that we give students access to as many different points of view as possible. The stakes are high and propaganda abounds in the sustainable energy debate so this will not be an easy task.

In summary the issue of finding a solution to the sustainable energy problem is one that those of us in social studies should not ignore. When the nation faced earlier energy shortages we responded with a comprehensive energy education program. Now that the energy crisis is "over", at least for the present, interest in

teaching about energy-related issues seems at an all time low. Short of another crisis how do we justify further work in the energy education arena?

I have proposed three generalizations, "big ideas", which I believe will be valid for many years and around which we can build the study of our current search for a sustainable energy. The content needed to study these generalizations crosses many of the traditional social studies subjects; we need not create a new course on the study of energy.

The transition from coal, oil, and natural gas to a more sustainable energy source is already underway, but it is subtle. This paper is a plea that we do something with the issue of sustainable energy now, before we get the next unpleasant wake-up call.

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Endnotes

1. A survey of students in my elementary social studies methods classes last year found that only about 5% of them ranked energy as a topic that was "extremely important."

2. Instructional materials having to do with nuclear power are available from Charlotte O'Neil, Science Applications International Corporation, Public Information and Communication Programs, 800 Oak Ridge Turnpike, P.O. Box 2502, Oak Ridge, TN 37831.